Reviews

Geology of the Hanagita-Bremner Region of Alaska. By F. H. Moffit. U.S. Geol. Survey, Bull. No. 576. Pp. 55, figs. 6, pls. 6, maps 2.

The area described in this report is in the southern part of the Copper River drainage basin. Chitina River bounds it on the north, and it extends southward half-way to the coast.

Field work in this region was of a reconnaissance character, but the larger stratigraphic units have been outlined. The oldest sediments are mainly schists, slates, and limestones, and have been referred to the Carboniferous. These beds have been deformed by close folding and faulting and cut locally by intrusions. Unconformable above them is a series of interstratified beds of slate and graywacke thought to be equivalent to the Valdez series, and early Mesozoic in age. This series is in turn unconformable beneath conglomerates and tuffaceous slates of Middle Jurassic age.

The district presents a number of problems in physiography. The drainage has a rectilinear arrangement which must bear some close relation to geologic structure. All the valleys have been profoundly glaciated. Many streams are now eroding valley trains. A number of situations appear very favorable for stream capture.

The author is inclined to doubt the theory that Copper River is an antecedent stream across the Chucagh Mountains. He suggests that ice erosion over a narrow divide enabled a southward-flowing stream to tap the Copper River and divert it from a westward course. To complete this theory it seems necessary to assume uplift along the western part of the basin to check the flow in that direction, and that along a great part of its course the Copper River has been reversed since the retreat of the ice.

W. B. W.

The Shinumo Quadrangle. By L. F. Noble. U.S. Geol. Survey, Bull. No. 549. Pp. 100, fig. 1, pls. 18.

The remarkable geologic section exposed in the Shinumo quadrangle rivals those that have been described previously in the Grand Canyon. The generally unaltered condition of the beds, the great vertical extent

of the exposures, and the absence of a vegetal mask reveal the geologic history in great detail.

The rocks in the quadrangle range from Archean to late Paleozoic in age. The pre-Cambrian portion of the section follows:

Proterozoic
  Grand Canon series (Unkar group)
    Great unconformity
      Dox sandstone.....2,297 feet.
      Shinumo quartzite.....1,564 "
      Hakatai shale..... 580 "
      Bass limestone..... 335 "
      Hotauta cong.....0 to 6 "
Archeozoic
    Great unconformity
      Vishnu schist

The Proterozoic sediments were deposited on a surface that represented almost perfect peneplanation. At the close of the period of deposition, uplift and great normal faulting inset these beds deeply into the Archean. This led to their preservation during the next period of great erosion, which again resulted in peneplanation by the close of the pre-Cambrian. Where not protected by faulting the Proterozoic beds were removed. The remnants are in great wedge-shaped masses, each bounded by a fault plane, and the two great erosion surfaces. In no other known region do two profound peneplains meet in a line.

Cambrian and Carboniferous sediments exist throughout the quadrangle. A disconformity represents the intervening systems. Mesozoic and Tertiary rocks ranging up to 6,000 feet in thickness formerly covered this area. In early Quaternary times a cycle of erosion, known as the "great denudation," drove their outcrops many miles to the north.

The writer follows Davis and others in recognizing but two cycles of erosion in the formation of present physiographic features. The first, the great denudation, developed a virtual peneplain, and the second, during the latter part of the Quaternary, resulted in cutting the Grand Canyon. The Esplanade and Tonto platforms, explained by Dutton as temporary base-levels, are held to be structural benches.

The writer also follows Davis in holding that the present course of the Colorado River was established before the beginning of the uplift that resulted in the canyon cycle of erosion. It is a superposed stream, let down from the surface of the peneplain of the great denudation.

W. B. W.